REMARKS

This is a response to the non-final office action mailed on October 17, 2007.

Claims 1, 9-19, 22-25, 28 and 30 are amended. Claims 31-34 are new. Claims 7, 8, 21 and 30 are cancelled. No new matter is entered. See, e.g., Figs. 1 and 2, and the specification, par. 38. Claim 30 is incorporated into claim 18.

Paragraph 1 of Office Action

Claims 16-20 and 30 have been amended in response to the rejection under 35 U.S.C. 112, second paragraph.

Paragraph 3 of Office Action

Claims 1, 22-24 and 28 have been rejected under 35 U.S.C §102(a) as being anticipated by US 2004/0047313 to Rumpf et al. (Rumpf). Applicants respectfully traverse the rejections.

Rumpf provides a communication system in which optical-wireless devices are coupled to the longitudinal side of an optical fiber. The optical-wireless devices include optical fiber power units which convert optical power into electrical power, and wireless communication units which are electrically powered by the optical fiber power units (abstract). The communication system can be a local area network (LAN) that interconnects computer workstation users (par. 2). Further, the optical fiber may be coupled to a server 16 to which electronic devices such as personal data assistants 13, cellular telephones 14 and personal computers 15 require access (par. 25, Fig. 1). However, Rumpf is not concerned with a communication system in which at least one optical transceiver unit is in communication with at least one base station in a cellular wireless communications network, and the at least one optical transceiver unit communicates reverse link radio frequency signals to the at least one base station and receives forward link radio frequency signals from the at least one base station.

Regarding Rumpf's use of a cellular telephone in communication with an optical fiber and a server, this is done to route voice communications among users on a LAN (par. 2). However, the server 16 does not provide a base station in a cellular wireless communications network as such terms are understood by those skilled in the art.

Accordingly, claim 1 and its dependent claims are clearly patentable over Rumpf.

For example, claim 24 sets forth a plurality of respective remote units, a different optical fiber data link between each respective optical transceiver unit and its respective remote unit, and a different optical fiber power link between each respective optical transceiver unit and its

respective remote unit for providing electrical power at the respective remote unit. Rumpf refers to using a single optical fiber or a duplex fiber assembly (par. 60), but there is no disclosure or suggestion of using different optical fiber data links and different optical fiber power links as claimed.

Withdrawal of the rejection is therefore respectfully requested.

Paragraph 5 of Office Action

Claims 1-4, 7-10, 12, 14 and 21 have been rejected under 35 U.S.C §103(a) as being unpatentable over US 6,362,906 to O'Shea in view of US 2003/0118280 to Miyazaki.

O'Shea provides a flexible optical RF receiver such as for spacecraft or aircraft. The receiver includes a flexible substrate with an array of receiving circuits. Power for operating the receiving circuits and all signal paths to and from the receiving circuits are accomplished via optical fibers. Photocells are provided within the receiving circuits for conversion of optical power to operating electric power (abstract). In particular, an optical fiber 70 provides power for operating an optical modulator 106 (Figs. 9 and 12, col. 5, lines 48-55). The optical modulator provides an optical output on an optical fiber 54 which is received at a receive beam former 90 (Fig. 9).

Miyazaki provides an optical transmission system which includes a control station (CS) and a radio base station (BS), where the base station does not require an electrical supply. The CS 10 provides an output on an optical fiber 30 to a photo detector 44 at the base station 40. The photo detector converts the input light into an electrical signal and sends the electrical signal to a port A of a diplexer 46. An antenna 42 is driven by the output from the photo detector for emitting a downstream signal to a mobile terminal 60. The antenna 42 also receives an upstream signal from the mobile terminal, and provides it to port B of the diplexer. The diplexer provides the signal to an optical modulator 48 through a port C. Laser light provided from the control station via an optical fiber 32 is input to the optical modulator. The light is reflected in the optical modulator, modulated by the upstream RF signal from the antenna, and a portion of the modulated light is reflected back along the optical fiber 32 to the control station. See Fig. 1 and par. 47-56. The antenna 42, photo detector 44, diplexer 46 and optical modulator operate without an electrical power supply (par. 59).

However, the cited references do not disclose or suggest Applicants' invention. For example, O'Shea's system does not involve an optical transceiver unit which is in

communication with a base station, and with a remote unit with an antenna as claimed. Similarly, Miyazaki's system uses a control station 10 and a base station 40 (par. 47), but there is no optical transceiver unit which is in communication with a base station, and with a remote unit with an antenna as claimed. Instead, the base station 40 itself includes an antenna 42. Similarly, the combination of these references would not lead to Applicants'' invention as there is no motivation to provide a separate remote unit from a base station.

Accordingly, claim 1 and its dependent claims are clearly patentable over O'Shea and Miyazaki.

For example, dependent claim 9 sets forth a radio frequency combiner between at least one optical transceiver unit and a plurality of base stations in a cellular wireless communications network for combining forward link radio frequency signals which are received from the plurality of base stations. O'Shea and Miyazaki are not concerned with combining forward link radio frequency signals which are received from a plurality of base stations as claimed, as O'Shea does not use a base station, and Miyazaki does not provide a component which receives or combines forward link radio frequency signals from a plurality of base stations.

Claim 10 sets forth a radio frequency combiner which is between a plurality of optical transceiver units and at least one base station for combining reverse link radio frequency signals which are received from a plurality of optical transceiver units. O'Shea and Miyazaki similarly have no concern with such a radio frequency combiner, as O'Shea does not use a base station, and Miyazaki does not provide a component which receives or combines reverse link radio frequency signals from a plurality of optical transceiver units.

Claim 12 sets forth a radio frequency splitter in communication with a plurality of base stations in a cellular wireless communications network, and associated with a radio frequency combiner, which splits a combined reverse link radio frequency signals. Again, O'Shea and Miyazaki similarly have no concern with such a radio frequency splitter.

Claim 14 sets forth a radio frequency combiner which is between a plurality of optical transceiver units and a plurality of base stations in a cellular wireless communications network. Again, O'Shea and Miyazaki have no concern with such a radio frequency combiner.

Withdrawal of the rejection is therefore respectfully requested.

Paragraph 7 of Office Action

Claims 5, 6, 11 and 13 have been rejected under 35 U.S.C §103(a) as being unpatentable over US 6,362,906 to O'Shea in view of US2003/0118280 to Miyazaki and further in view of US 5,664,035 to Tsuji. These claims are patentable at least by virtue of their dependence on independent claim 1, which is patentable for the reasons discussed above.

Withdrawal of the rejection is therefore respectfully requested.

Paragraph 8 of Office Action

Claims 15 and 29 have been rejected under 35 U.S.C §103(a) as being unpatentable over US 6,362,906 to O'Shea in view of US2003/0118280 to Miyazaki and further in view of US5,949,564 to Wake.

Claim 15 is patentable at least because it sets forth at least one optical transceiver unit in communication with at least one base station in a cellular wireless communications network, where the at least one optical transceiver unit communicates reverse link radio frequency signals to the at least one base station and receives forward link radio frequency signals from the at least one base station. In contrast, as mentioned, O'Shea is concerned with a communication system for spacecraft or aircraft in which there is no such optical transceiver unit in communication with at least one base station in a cellular wireless communications network as claimed. Similarly, Miyazaki's system uses a control station 10 and a base station 40 (par. 47), where the base station 40 itself includes an antenna 42, but there is no optical transceiver unit which is in communication with a base station, and with a remote unit with an antenna, as claimed.

O'Shea and Miyazaki do not disclose or suggest at least one optical transceiver unit in communication with at least one base station in a cellular wireless communications network, where the at least one optical transceiver unit communicates reverse link radio frequency signals to the at least one base station and receives forward link radio frequency signals from the at least one base station.

Wake is cited as allegedly providing means for converting the electrical power into a form that is required to power means for converting optical data signals to radio frequency signals. With Wake, an optical signal is provided to a high speed photodiode 18 and a low speed photodiode 19 in a self-biasing photodetector 17. Photodiode 19 generates a photocurrent which is substantially a DC current and provides it on an electrical connection 22 to the photodiode 18 (col. 5, line 48 to col. 6, line 10, Fig. 6). However, there is no mention that photocurrent is converted into a specific form, e.g., after it is generated. Instead, the photocurrent is provided

directly to the photodiode 18 in the same form in which it is generated by the photodiode 19, so there is no converting as claimed. Accordingly, the combination of these references, if made, arguendo, still fails to result in Applicants' claimed invention. Claim 29 is similarly patentable at least by virtue of its dependence on claim 15.

Withdrawal of the rejection is therefore respectfully requested.

Paragraph 9 of Office Action

Claim 16 has been rejected under 35 U.S.C §103(a) as being unpatentable over US 6,362,906 to O'Shea in view of US2003/0118280 to Miyazaki and further in view of US 2004/0047313 to Rumpf. Independent claim 16 is patentable at least for the reasons discussed in connection with claims 1 and 9. The cited references, taken alone or in combination, fail to disclose or suggest at least combining forward link radio frequency signals which are received from a plurality of base stations to provide combined forward link radio frequency signals, and based on the combined forward link radio frequency signals, communicating an optical data signal from a central unit to a remote unit. None of the references provides for receiving radio frequency signals from a plurality of base stations, combining such signals, and communicating a corresponding optical data signal.

Withdrawal of the rejection is therefore respectfully requested.

Paragraph 10 of Office Action

Claim 17 has been rejected under 35 U.S.C §103(a) as being unpatentable over US 6,362,906 to O'Shea in view of US 2004/0047313 to Rumpf. (Applicants note that the rejection of claim 17 should refer to Rumpf, not Wake, in connection with US2004/0047313).

Claim 17 is analogous to claim 16 but refers to converting respective optical data signals, which are received at a central unit from different remote units, to respective radio frequency signals, combining the respective radio frequency signals, and, responsive to the combining, communicating combined respective radio frequency signals to at least one base station in a cellular wireless communications network. Independent claim 17 is patentable at least for the reasons discussed in connection with claims 1 and 10. None of the references, taken alone or in combination, provides for receiving radio frequency signals from a plurality of remote units, combining such signals, and communicating corresponding combined respective radio frequency signals.

Paragraph 11 of Office Action

Claims 18-20 and 30 have been rejected under 35 U.S.C §103(a) as being unpatentable over US 6,362,906 to O'Shea in view of US2003/0118280 to Miyazaki and further in view of US 6,414,958 to Specht. Independent claim 18 sets forth a remote unit having first means for converting optical data signals to radio frequency signals and converting radio frequency signals to optical data signals, and second means for converting optical data signals into baseband digital signals and converting baseband digital signals to optical data signals. Further, at least one optical fiber data link is associated with the first means for transmitting optical data signals, and at least one optical fiber data link is associated with the second means for transmitting optical data signals. Moreover, at least one optical fiber power link provides electrical power at the remote unit.

As Applicants have argued previously, Specht provides a system for communicating between ATM LANs using a satellite communications network. In this system, master stations 725 and 735 have associated Ethernet hubs 730 and 740 that recognize which data traffic belongs to which network (Fig. 7, col. 10, lines 38-40). The Office Action asserts that it would be obvious to combine the references as asserted to use Ethernet, with digital signals, over RF to provide a geographically expanded LAN communications. However, O'Shea and Miyazaki provide no disclosure or suggestion of converting optical data signals into baseband digital signals and converting baseband digitals signals to optical data signals as set forth in claim 18. Instead, O'Shea is concerned with a flexible optical RF receiver for a satellite or aircraft while Miyazaki is concerned with a base station that communicates with mobile terminals. Accordingly, a person of ordinary skill in the art would not be led to combine the references as asserted in the Office Action.

Paragraph 15 of the Office Action indicates that the Examiner has not responded to Applicants' arguments regarding claim 18 because of a new ground of rejection. However, Applicants do not believe there is a new ground of rejection as the current rejection and the prior rejection are both 35 U.S.C §103(a) rejections under O'Shea, Miyazaki and Specht. The Examiner is therefore requested to address Applicants' arguments.

Withdrawal of the rejection is respectfully requested.

Paragraph 12 of Office Action

Claims 25-27 have been rejected under 35 U.S.C §103(a) as being unpatentable over US 2004/0047313 to Rumpf in view of Banwell. These claims are patentable at least by virtue of their dependence on independent claim 1, which is patentable for the reasons discussed above.

Withdrawal of the rejection is therefore respectfully requested.

New claims

New independent claim 31 is patentable based on the reasoning discussed previously, including at least the inclusion of a plurality of base stations in a cellular wireless communications network, and a central unit comprising a plurality of optical transceiver units and a radio frequency splitter-combiner.

New claim 32 is patentable at leas at based on the reasoning discussed previously in connection with claim 9.

New claim 33 is patentable at leas at based on the reasoning discussed previously in connection with claim 10.

New claim 34 is patentable at leas at based on the reasoning discussed previously in connection with claim 12.

Conclusion

In view of the above, each of the pending claims is believed to be in condition for immediate allowance. The Examiner is therefore requested to pass this application on to an early issue. Should further questions remain, the Examiner is invited to contact the undersigned attorney by telephone.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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